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Four priorities for new links between conservation science and accounting research

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Abstract:	

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Engagement with a diversity of social science disciplines is essential to advance the frontiers of conservation research by shedding light on political, social and institutional challenges that are central to address effectively biodiversity conservation issues (Bennett et al. 2017; Teel et al. 2018).

One such challenge that remains insufficiently investigated is frustration with the lack of real-world conservation impact of innovative information tools and systems of accounts aimed at motivating and guiding ecosystem management. The conservation community invests considerable efforts in their creation and experimentation. Species and ecosystem accounts (e.g. ABoS 2015; UNEP-WCMC 2016), tools for ecosystem services quantification and mapping (e.g. Kareiva et al., 2011), general ecological indicators (e.g. Jorgensen et al., 2013) or tools for monitoring particular ecosystems have become a fundamental part of conservation research and practice. However, conservation scientists often complain that such ecosystem-based tools do not lead to the kind of changes in decision, action or policy that they would expect (e.g. Ruckelshaus et al. 2015).

In many cases, the inability of such information systems to generate expected changes is not due to their technical limitations, but rather to the too fragile articulation between their design on the one hand, and the complex realities of developing strategies and organizing the management of ecosystems in a diversity of contexts on the other hand. Investigating such articulation between an information system and the organizational details of its systematic use is precisely what characterizes an important academic field:

accounting, which belongs to management as a discipline, and often intersects with social sciences or economics. Accounting has enormous (and yet largely untapped) potential to contribute to conservation science, practice and goals. Accounting is often misconceived as being only the craft of producing quantitative and financially focused reports for companies. However, accounting in its broadest sense can be thought of as so much more (Jollands 2017): the preparation and the framing of information (both qualitative and quantitative) to assist specific organizing and decision-making processes.

We especially refer here to critical and interpretive accounting research, a field that first emerged in the 1970s through the now well-established *Accounting, Organizations and Society* journal and subsequently developed with the support of other key journals, such as *Accounting, Auditing and Accountability Journal* or *Critical Perspectives on Accounting* (for overviews, see Miller & Power 2013; Roslender 2017). Since the 1990s, researchers in this field have revealed and criticized the lack of consideration of sustainability issues in existing accounting systems (e.g. Milne 1996) and advocated the development of new accounting approaches inspired by ecological thinking, at the level of the corporation and beyond (e.g. Birkin, 1996; for overviews, see Bebbington & Larrinaga 2014; Russell et al. 2017).

The work presented here follows a recent publication that puts forward a new line of inquiry that focuses on developing accounting research at the level, not of the firm, but of the collective management of ecosystems (Feger & Mermet 2017). This paper is the result of a subsequent in-depth interdisciplinary dialogue between accounting scholars and conservation researchers and practitioners initiated during a workshop in Cambridge in September 2017. It underlines that new collaboration between conservation and

accounting research is essential to improve the ways in which ecosystem-based information systems get to be actually used for accountable conservation decision and action. To this end, it identifies four key areas for future joint research.

What can the accounting discipline bring to the conservation table?

Our call to establish new links between the accounting discipline and biodiversity conservation is not meant to be a substitute for economics, game theory, organizational psychology, or in fact, any other social science discipline focusing primarily on decision-making. It is an invitation to focus on questions that are instrumental and common to both conservation and accounting research such as: how do we keep records in practice, with what consequences? What kind of languages and representations can one provide to complex forms of organizations? Who is liable to giving and demanding what kind of accounts? How do we negotiate, organize, manage and control responsibilities? How do we debate and institutionalize explicit principles and conventions on which accounts can be developed, values can be defined and upon which past and future actions can be assessed and compared?

The pervasive confusion in the environmental field between the disciplines of accounting and economics deserves a special comment here. While economics and accounting are somewhat related, they are essentially different disciplines (Shiozawa 1999). Accounting shares with economics its concern for developing and using calculative practices for the purpose of supporting decision-making. The use of economics in conservation science has brought major results if we consider for instance the development of economic valuation of ecosystem services, the analysis of environmental trade-offs or the study of incentive

structures (Helm & Hepburn 2012). One of the distinctive characteristics of the accounting discipline however is that it focuses on the detailed analysis of the roles of information systems in the context of the concrete complexities of organizational management, based on the fundamental concepts of 'accounts' and 'accountability' (Burchell et al 1980; Roberts and Scapens 1985; Gray et al. 2014). In terms of methods, a specificity of accounting research is to combine theoretical developments that extensively draw on other social science disciplines (organizational theory, sociology, philosophy, economics, psychology, etc.) with in-depth qualitative field studies of organizations (Ahrens & Chapman 2006). In doing so, it enriches our understanding of the role of information systems and accounts in the operationalization of action and in generating intended or unintended organizational changes and wider governance transformations (Miller 2001; Macintosh & Quattrone 2010).

The new dialogue we are advocating between conservation scientists and accounting researchers can build especially on a small but growing body of work in accounting research, centred on ecosystems, that aims (1) to study the effects of varying forms of accounting upon relations between human organizations and biodiversity (e.g. Tregidga 2013; Dey & Russell 2014; Cuckston 2017); and (2) to develop accounting innovations adapted to the collective management of ecosystems (Feger & Mermet 2017).

Four priorities for the development of accounting for the management of ecosystems

Our interdisciplinary dialogue has identified four priority areas for collaborative research.

(1) *Studying ecosystem-centred accountabilities* – A first priority is to study in greater depth how, in a diversity of ecosystem management situations, stakeholders actually use (or how they could use) ecological and related social, health, economic and financial information to assign responsibilities to one another and to discuss, negotiate and manage reciprocal commitments (i.e. accountabilities) for improving environmental outcomes. This means exploring questions such as: what commitments have been, are being or should be negotiated among stakeholders? Who is accountable to whom, and who is not, around the management of the quality of a given ecosystem? How should information be framed and exchanged to organize these accountabilities effectively? An accounting lens can illuminate how different ways of structuring, representing and giving and demanding environmental information can lead to the creation of viable forms of ecosystem-centred management to achieve conservation outcomes (Roberts & Scapens 1985; Dey & Russell 2014; Feger & Mermet 2017; Cuckston 2017).

(2) *Working collaboratively on real-world cases* – To take this agenda forward, conservation scientists and accounting researchers need to jointly conduct in-depth studies and comparisons of real-world field cases through an accounting lens. This calls for the development of a portfolio of case studies both reflecting on past cases and observing and documenting active on-going cases, e.g. through action research interventions.

(3) *Adopting a constructive, practical, critical and reflective approach* – In working collaboratively on concrete cases, conservation scientists, accounting researchers, and decision-makers will engage in constructive discussion to improve the design and use of

ecosystem-based information tools. This calls for pragmatic trial and error approaches, relying on the action-oriented agenda and reflexive culture that has from the start been a common trait of both conservation biology (see for instance the literature on adaptive management: Gunderson & Holling 2002; or evidence-based conservation: Sutherland et al. 2004) and accounting research (Gray 2002).

(4) *Developing a common language* – These four priority goals require intensive interdisciplinary dialogue and the development of a common language. Concepts coming from the field of accounting need to be adapted and enriched to analyse and discuss the organizing of ecosystem management and conservation action (e.g. 'ecological account', 'accounting entities and perimeters', 'accountabilities', etc.) (Russell et al. 2017). There is an urgent need to continue the work of theoretical clarification between the specificities of accounting concepts, as distinct from concepts used in the field of economics or ecology, especially when they seem to overlap, e.g. "valuation" or "capital" for instance (Rambaud & Richard 2015). Finally, the formulation of new concepts and vocabularies (e.g. 'reciprocal commitments') has to play a central role in the joint efforts of accountants and conservation scientists to develop an accounting approach for the management of ecosystems.

Conclusion

These four priorities for the development of accounting approaches that are centered on the management of ecosystems set up an agenda that has the power to reshape both (1) conservation practice and the way ecosystem-based information tools are designed and used in conservation action; (2) and accounting research and the way accounting entities

and accountabilities are understood. By collaboration and engagement across these two disciplines, there is scope for contributing to constructive critical reasoning and scope to introduce innovative design that combines insights from accounting and conservation biology. Ultimately, this new interdisciplinary bridge will provide a critical, theoretical and practical addition to the already well-established collaborations of conservation research with other fields in the social sciences such as economics, anthropology, political ecology and sociology.

Literature Cited

Ahrens, T., and Christopher S.C. 2006. "Doing Qualitative Field Research in Management Accounting: Positioning Data to Contribute to Theory." Accounting, Organizations and Society **31**: 819–41.

Australian Bureau of Statistics (ABoS). 2015. "Experimental Ecosystem Accounts for the Great Barrier Reef." http://www.abs.gov.au/ausstats/abs@.nsf/papersbyTopic/FB46321B5BA1A8EACA257E2800174158?OpenDocument.

Bebbington, J., and Larrinaga, C. 2014. "Accounting and Sustainable Development : An Exploration." Accounting, Organizations and Society **39** (6):395–413.

Bennett, N.J, R Roth, S.C Klain, K.M.A Chan, D.A Clark, G Cullman, G Epstein, et al. 2017b. "Mainstreaming the Social Sciences in Conservation." Conservation Biology **31** (1):56–66.

Birkin, F. 1996. "The Ecological Accountant: From the Cogito to Thinking like a Mountain." Critical Perspectives on Accounting **7**: 231–57.

Burchell S., Clubb C., Hopwood A., Hughes J., Nahapiet J. 1980. "The roles of accounting in

organizations and society". Accounting, Organizations and Society. **5** (1):5-27.

Cuckston, T. 2017. "Ecology-Centred Accounting for Biodiversity in the Production of a Blanket Bog." Accounting, Auditing & Accountability Journal **30** (7):1537–67.

Dey, C. and Russell, S. 2014. "Who Speaks for the River? Exploring Biodiversity Accounting Using an Arena Approach." pages 245–266 in Jones, M.J. Accounting for Biodiversity. Oxon: Routledge.

Feger, C, and Mermet, L. 2017. "A Blueprint towards Accounting for the Management of Ecosystems." Accounting, Auditing & Accountability Journal **30** (7):1511–36.

Gray, R. 2002. "The Social Accounting Project and Accounting Organizations and Society. Privileging Engagement, Imaginings, New Accountings and Pragmatism over Critique?" Accounting, Organizations and Society **27** (7): 687–708.

Gray R., Brennan A., Malpas J. 2014. "New accounts : Towards a reframing of social accounting". Accounting Forum **38** (4):258–273.

Gunderson, L.H, and Holling, C.S. 2002. Panarchy: Understanding Transformations in Human and Natural Systems. Washington, D.C.

Helm D., Hepburn C. 2012 "The economic analysis of biodiversity: an assessment". Oxford Review of Economic Policy. **28** (1):1-21.

Jollands, S. 2017. Accounting. Pages 319-346 in S Jeanrenaud, J-P Jeanrenaud, and J Goslin editors. Sustainable Business: A One Planet Approach. Wiley.

Jørgensen, S.E, Burkhard, B., and Müller, F. 2013. "Twenty Volumes of Ecological Indicators – An Accounting Short Review." Ecological Indicators **28** (May):4–9.

Kareiva, P., Tallis, H., Ricketts, T.H., Daily, G.C., and Polasky, S. 2011. Natural Capital. Theory and Practice of Mapping Ecosystem Services. New York: Oxford University Press.

Macintosh, N., and Quattrone, P. 2010. Management Accounting and Control Systems. An

Organizational and Sociological Approach. 2nd edition. West Sussex, UK: John Wiley & Sons Ltd.

Miller, P. 2001. "Governing by Numbers : Why Calculative Practices Matter." Social Research **68** (2).

Miller, P., and Power, M. 2013. "Accounting, Organizing, and Economizing: Connecting Accounting Research and Organization Theory." The Academy of Management Annals **7** (1): 557–605.

Milne, M. J. 1996. "On Sustainability, the Environment and Management Accounting." Management Accounting Research **7** (1): 135–61.

Rambaud, A, and Richard, J. 2015. "The 'Triple Depreciation Line' instead of the 'Triple Bottom Line': Towards a Genuine Integrated Reporting." Critical Perspectives on Accounting **33**:92-116.

Roberts, J., and Scapens, R.W. 1985. "Accounting Systems and Systems of Accountability - Understanding Accounting Practices in Their Organisational Contexts." Accounting Organizations and Society 10 (**4**): 443–56.

Roslender, R. 2017. The Routledge Companion to Critical Accounting. 1st ed. London: Routledge.

Ruckelshaus, M., McKenzie, E., Tallis, H., Guerry, A., Daily, G.C., Kareiva, P., Polasky, S., Ricketts, T., Bhagabati, N., Wood, S.A., et al. 2015. "Notes from the Field: Lessons Learned from Using Ecosystem Service Approaches to Inform Real-World Decisions." Ecological Economics. 115: 11–21.

Russell, S., Milne, M., and Dey, C. 2017. "Accounts of Nature and the Nature of Accounts: Critical Reflections on Environmental Accounting and Propositions for Ecologically Informed Accounting." Accounting, Auditing & Accountability Journal **30** (7):1426–58.

Shiozawa, Y. 1999. “Economics and Accounting: A Comparison between Philosophical Backgrounds of the Two Disciplines in View of Complexity Theory.” Accounting, Auditing & Accountability Journal **12** (1): 19–38.

Sutherland, W J, Pullin, A.S., Dolman, P.M. and Knight. T.M. 2004. “The Need for Evidence-Based Conservation.” Trends in Ecology & Evolution **19** (6): 305–8.

Teel, T.L, Anderson, C.B., Burgman, M.A., Cinner, J., Clark, D., Estévez, R.A., Jones, J.P.G., et al. 2018. “Publishing Social Science Research in Conservation Biology to Move beyond Biology.” Conservation Biology **32** (1): 6–8.

Tregidga, H. 2013. “Biodiversity Offsetting: Problematisation of an Emerging Governance Regime.” Accounting, Auditing & Accountability Journal **26** (5):806–32.

UNEP-WCMC. 2016. “Exploring Approaches for Constructing Species Accounts in the Context of the SEEA-EEA.” UNEP-WCMC.